



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,283	02/11/2002	Hideaki Yamasaki	33082M121	9824

7590

07/24/2003

Smith Gambrell & Russell  
Beveridge DeGrandi Weilacher & Young  
Intellectual Property Group  
1850 M Street NW Suite 800  
Washington, DC 20036

EXAMINER

HASSANZADEH, PARVIZ

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 07/24/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/049,283

Applicant(s)

YAMASAKI ET AL.

Examiner

Parviz Hassanzadeh

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,6,7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Drawings*

Figures 7 and 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "16" in Fig. 8. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al (US Patent No. 5,711,815).**

Lee et al teach a film-forming unit (Fig. 14) comprising:

a processing container (chamber 70) in which a vacuum can be created;

Art Unit: 1763

a stage (table 84) arranged in the processing container, on which an object (semiconductor wafer S) to be processed is placed;

a process-gas supplying means (gas supply pipe 81 connected to a gas introducing chamber 82 having gas diffusion plate 83) for supplying a process gas into the processing container;

a heating means (heating chamber 101) for heating the object to be processed placed on the stage;

a division wall (projection 71a of sidewall 71) that surrounds a lateral side and a lower side of the stage;

an inert-gas supplying means (purge gas supply paths 75) for introducing an inert gas into a stage-side region surrounded by the division wall; and

a gap-forming member whose inner peripheral portion is arranged above a peripheral portion of the object to be processed placed on the stage via a gap and whose outer peripheral portion is arranged above the division wall via a gap (*ring member 90 including an annular press ring portion 91 formed to cover the entire peripheral edge portion of the wafer, and contact portions 92 provided at intervals in a circumferential direction and forming gap between the wafer and the portion 91, wherein a gap E between portion 91 and wafer is about 10 $\mu$ m-200 $\mu$ m and the gap between the portion 91 and upper surface of protrusion wall 71a is about 0.5 mm-3mm, see Fig. 16*) (column 9, line 6 through column 10, line 48).

*Further regarding claims 2, 4, 5, 6: ring member 90 including an annular press ring portion 91 formed to cover the entire peripheral edge portion of the wafer, and contact portions 92 provided at intervals in a circumferential direction, wherein a gap E between portion 91 and*

Art Unit: 1763

wafer is about  $10\mu\text{m}$ - $200\mu\text{m}$  and the gap between the portion 91 and upper surface of protrusion wall 71a is about  $0.5\text{mm}$ - $3\text{mm}$ , see Fig. 16 (column 9, line 63 through column 10, line 14).

*Further regarding claim 3:* ring member 90 is vertically movable by a drive mechanism 94 (column 10, lines 43-48).

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US Patent No. 5,711,815) in view of Eisuke et al (JP 09186095A).

Lee et al teach all limitations of the claims as discussed above and further including a circulation path 72 of cooling water for cooling the process chamber 70 (column 9, lines 40-71); however, Lee et al fail to explicitly teach a controller for setting a temperature of the processing chamber to be higher than a condensation temperature of the process gas and lower than a decomposition temperature and reaction temperature of the process gas.

Art Unit: 1763

Eisuke et al teach a film forming apparatus wherein heating medium is fed to the wall of a reaction chamber 9 so as not to condense CVD gas to prevent the formation of a reaction film onto the wall (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to set the temperature of the container as taught by Eisuke et al so that not to condense CVD gas in order to prevent the formation of the reaction film to the chamber.

**Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US Patent No. 5,711,815) in view of Asako et al (JP 09316644A).**

Lee et al teach all limitations of the claims as discussed except for controller for setting a temperature of the process-gas supplying device to be higher than a condensation temperature of the process gas and lower than a decomposition temperature and a reaction temperature of the process gas.

Asako et al teach film forming apparatus wherein a showerhead nozzle 11 including passages 15 for flowing therethrough a heat exchange fluid thereby controlling the temperature of the showerhead (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the temperature controlling mechanism as taught by Asako et al in the apparatus of Lee et al in order to set the temperature of the gas supplying device so that not to condense CVD gas in order to prevent the formation of the reaction film to the chamber.

**Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US Patent No. 5,711,815) in view of Moslehi (US Patent No. 5,400,209).**

Art Unit: 1763

Lee et al teach all limitations of the claims as discussed except for an electrostatic chuck provided in the stage.

Moslehi teaches a wafer support including a chuck 30 for electrostatically supporting a wafer 22 (abstract, Fig. 1, column 3, lines 29 through column 4, line 32).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the electrostatic chuck as taught by Moslehi in the apparatus of Lee et al in order to support the wafer electrostatically.

**Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al (US Patent No. 5,711,815) in view of Toshikatsu (JP 09260469A).**

Lee et al teach all limitations of the claims as discussed except for the gap forming member is provided with a heater and a thermocouple.

Toshikatsu teaches a vacuum treatment apparatus wherein a clamp 9 and a clamp holding member 12 including a heater wire 14 for heating the member to a prescribed temperature.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to implement the heating mechanism as taught by Toshikatsu in the apparatus of Lee et al in order to heat the gap forming member to a prescribed temperature.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

*Matsuse et al (US Patent No. 5,997,651)* teach a film forming apparatus (Fig. 1) including a purge gas port 71 and a division wall 66, and gap forming member 42;

Art Unit: 1763

*Mizuno et al (US Patent No. 5,494,494)* teach a film forming apparatus wherein a gap forming member 9 having a contact surface 10 as shown in Figs. 17-19); and

*Cheng et al (US Patent No. 5,851,299)* teach a film forming apparatus including a shield ring 50 (Fig. 5) and a purge gas port 16.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Parviz Hassanzadeh whose telephone number is (703)308-2050. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703)308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703)872-9310 for regular communications and (703)872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

*P. Hassanzadeh*  
Parviz Hassanzadeh  
Primary Examiner  
Art Unit 1763

July 23, 2003